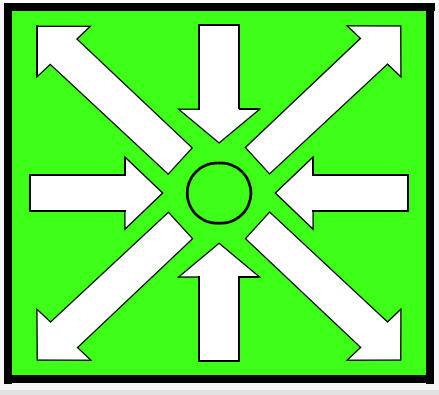
Cabletron SmartSwitch Router
Enterasys X-Pedition Switch Router



Supports SM-CSI1091 and SM-ENT1005 Management Modules

APRISMA SPECTRUM® POWERED SOLUTIONS

Device Management

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Introduction

This section introduces the SPECTRUM Device Management documentation for SmartSwitch Router devices.

This introduction contains the following topics:

- *Purpose and Scope*
- *Required Reading*
- *Overview* (Page 6)
- *Supported Devices* (Page 7)
- *The SPECTRUM Model* (Page 8)

Purpose and Scope

Use this document as a guide for managing the SmartSwitch Router devices described on Page 7 with SPECTRUM management modules SM-CSI1091 and SM-ENT1005. This document describes the icons, menus, and views that enable you to remotely monitor, configure, and troubleshoot SmartSwitch Router devices through software models in your SPECTRUM database.

Information specific to the SM-CSI1091 and SM-ENT1005 is what is primarily included in this document. For general information about device management using SPECTRUM and explanations of SPECTRUM functionality and navigation techniques, refer to the topics listed under *Required Reading*.

Required Reading

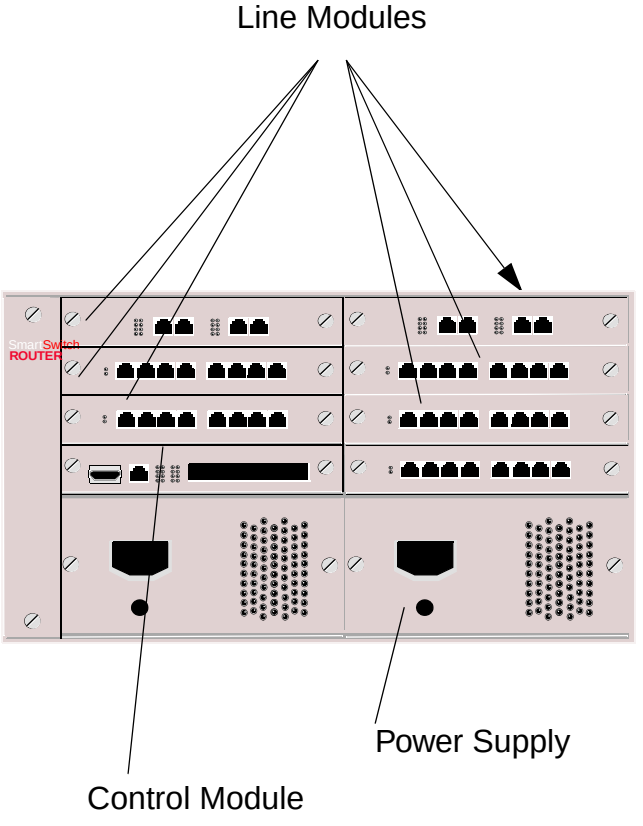
To use this documentation effectively, you must be familiar with the information covered by the other SPECTRUM online documents listed below.

- ***Getting Started with SPECTRUM for Operators***
- ***Getting Started with SPECTRUM for Administrators***
- ***How To Manage Your Network with SPECTRUM***
- ***Autodiscovery User's Guide***
- ***Core Watch User's Guide***
- ***SPECTRUM Views***
- ***SPECTRUM Menus***
- ***SPECTRUM Icons***

Overview

The SmartSwitch Router (Figure 1) is a Gigabit Ethernet/wide-area router that consists of a fan-cooled 8-slot or 16-slot chassis. The SSR-8000 can support up to seven hot-swappable line modules with one control module and two power supplies for power redundancy. A second control module can be added for redundancy at the expense of one of the line cards. Similarly, the SSR-8600 can support up to 15 line cards, or 14 if a second control module is installed.

Figure 1: SmartSwitch Router



Supported Devices

The SmartSwitch Router includes a Control Module and Line Modules as described below:

Control Module

The control module is used to manage the line modules. It is responsible for maintaining route table and bridge table information, SNMP management, and system housekeeping. It has a 200 MHz R5000 processor that runs spanning tree algorithms and routing protocols such as RIP, BGP4 and OSPF. It has two front panel interfaces for side and out-of-band management.

Table capacity is based on the amount of memory within the control module. Configurations may be either 64 MB for up to 50,000 routes, or 128 for up to 100,000 routes.

Line Modules

The line modules determine the number of flows that a SmartSwitch Router can handle. Line modules with 4 MB of memory can support up to 500,000 L4 flows, with 16 MB they can support up to 2,000,000 flows. The line modules store bridge table and MAC address information from the L2 table on the control module.

Table 1 through Table 3 list the line modules that are supported:

Table 1: Cabletron Devices

Device	Model Type	MM
SSR-32000	SmartSwRtr32	SM-CSI1091
SSR-8600 SSR-8000 SSR-3000 SSR-2100 SSR-2000 SSR-1200 IA-1100	SmartSwRtr	SM-CSI1091

Table 2: Enterasys Devices

Device	Model Type	MM
X-Pedition ER16	XPedER16SwRtr	SM-ENT1005
X-Pedition 8600 X-Pedition 8000 X-Pedition 2100 X-Pedition 2000	XPedSwRtr	SM-ENT1005

Table 3: Terayon Devices

Device	Model Type	MM
BE2xx	BE2xx	SM-TRN1000

Compaq, DEC and Olicom variants of 2000, 8000 and 8600 are also managed as SmartSwRtr from SM-CSI1091.

The SPECTRUM Model

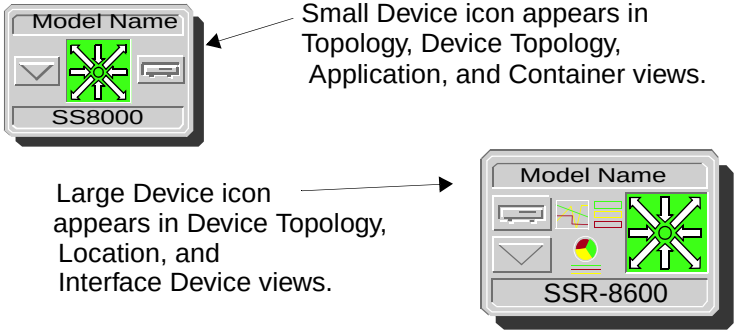
The model types for the SmartSwitch Router devices are listed in Table 1 - Table 3. Once modeled, the type of device is displayed in the Device icon's Model Type label. The Model Type label is updated to indicate the SSR type e.g., SSR-8000 or SSR-8600.

Modeling results in the creation of Device icons that represent the devices and Application icons that represent their supported applications.

The Device icons contain double-click zones and provide access to Icon Subviews menus that let you perform device management activities such as those listed in *Tasks* on Page 10.

As Figure 1 shows, the appearance of the Device icons varies slightly depending on the kind of view it appears in.

Figure 2: Small and Large Device Icons


Model Name
SS8000
Small Device icon appears in Topology, Device Topology, Application, and Container views.
Large Device icon appears in Device Topology, Location, and Interface Device views.
Model Name
SSR-8600

The device-specific Icon Subviews menu options available from the Device icon are listed below.

Option	Accesses the...
Device	*Device Views* (Page 11)
Dev Top	*Device Topology Views* (Page 20)
Application	*Application Views* (Page 22)
Configuration	*Configuration Views* (Page 34)
Rtr Redundancy	*Redundancy and Model Reconfiguration Options View* (Page 39)
Chassis	*SSR Chassis Application (SSR_ChasApp)* (Page 24)
Fault Management	For further information refer to the ***How to Manage Your Network with SPECTRUM*** documentation.
Model Information	*Model Information View* (Page 48)
Primary Application	Menu options that let you select Routing, Gen Bridge App, MIB-II, Ethernet App or rfc2338App as the primary application.

The following views are accessible from the Device icon for the SmartSwitch Router.

- *Device Views* (Page 11)
- *Device Topology Views* (Page 20)
- *Application Views* (Page 22)
- *Performance Views* (Page 32)
- *Configuration Views* (Page 34)
- *Model Information View* (Page 48)

Tasks

This section contains an alphabetical list of device management tasks, with each task providing one or more links to views that let you perform the task.

Application Information (examine)

- *Application Views* (Page 22)

Device (configure)

- *Device Views* (Page 11)

Enable/Disable a Port (examine/modify)

- *Interface Status View* (Page 14)
- *Admin. Status* (Page 35)
- *Admin Status* (Page 39)

Identify Current Protocols (monitor)

- *Service Status View* (Page 27)

Interface or Port Operation (monitor)

- *Device Views* (Page 11)
- *Interface Label Icon Subviews Menu* (Page 14)
- *Device Topology Views* (Page 20)
- *Operation Status* (Page 39)

Model the SmartSwitch Router (modify)

- *The SPECTRUM Model* (Page 8)

Port Statistics (monitor)

- *Device Performance View* (Page 33)
- *IF Performance View* (Page 33)

Set Interface Thresholds (modify)

- *IF Thresholds* (Page 18)

Transfer Configuration File (modify)

- *Configuration Views* (Page 34)

Device Views

This section describes the Device views and subviews available for models of SmartSwitch Router devices in SPECTRUM.

These views display icons and labels that represent the device, its modules and ports or interfaces, and applications. This view is described in general under ***SPECTRUM Views*** within the SPECTRUM online documentation. The information provided within this document is specific to this device. The following Device views are available for the SmartSwitch Router:

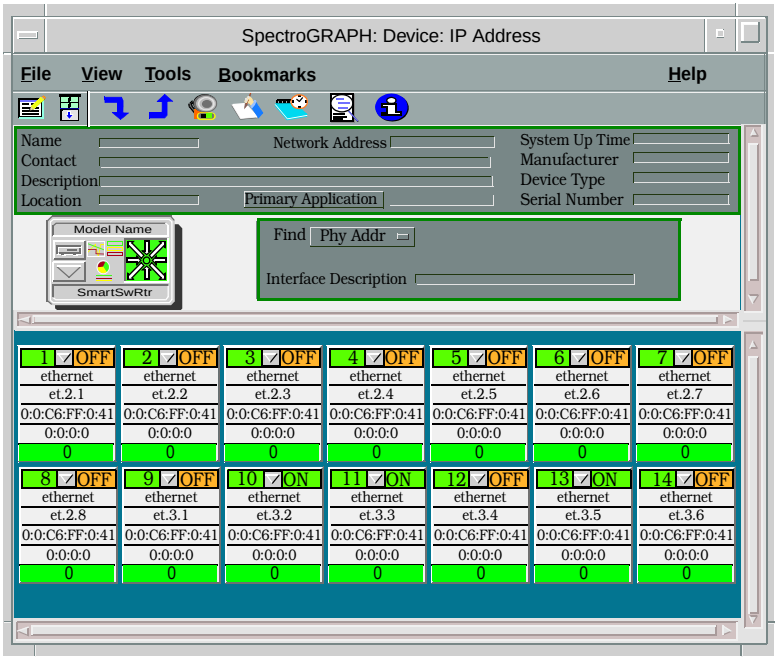
- *Interface Device View*
- *Chassis Device View* (Page 15)
- *Chassis Device View for the 6-SSRM-02* (Page 18)

Interface Device View

Access: *From the* ***Icon Subviews*** *menu for the Device icon, select* ***Device > Interface****.*

This view displays icons (Figure 3) that represent the interfaces for the SmartSwitch Router.

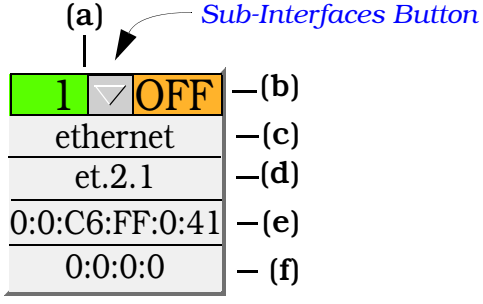
Figure 3: Interface Device View



Interface Icons

This section describes the icons that represent the front panel interfaces on the SmartSwitch Router line modules. Figure 4 shows the interface icon and its labels/double-click zones.

Figure 4: Interface Icon



- **a** *Port Number Label*
- **b** *Administrative Status Label*
- **c** *Interface Type Label*
- **d** *Interface Description Label*
- **e** *Physical Address Label*
- **f** *IP Address Label*

Port Number Label

This label identifies this port. The number represents the port number on this module.

Sub-Interfaces Button

This button appears on an Interface icon when the interface model has sub-interfaces associated with it. Examples include a physical ATM interface with Permanent Virtual Circuits (PVCs) provisioned on it or a physical Frame Relay interface with DCL circuits on it. The endpoints of these multiplexed connections are modeled by SPECTRUM as sub-interfaces. Double-click this button to access the *Sub-Interfaces Topology View* (Page 21).

Administrative Status Label

This label displays the administrative state of this port. It also provides double-click access to the *IF Status* (Page 14) view.

Table 4 lists the possible states relative to the application selected. The default application for this view is Physical (MIB-II). To select the application to be displayed (Physical or Bridging), click the **Filter** menu button in the Interface Options panel.

Table 4: Interface Status Label Colors

Color	Operational Status	Administrative Status	Label Text
Green	ON	ON	ON
Blue	OFF	OFF	OFF
Yellow	OFF	ON	OFF
Red	Testing	Test	TST

Interface Type Label
This label displays the type of network interface module. Double-click this label to open the *Interface Configuration View* (Page 34).

Interface Description Label
This label identifies the type of network to which this interface is connected. Double-click the label to open the *Model Information View* (Page 48) for the interface.

Physical Address Label
This label displays the physical (MAC) address of the interface.

IP Address Label
This label displays the IP address for the interface. Double-click the label to open the *Secondary Address Panel* (Page 14), which allows you to change the address and mask for this interface.

Interface Label Icon Subviews Menu

Table 5 lists each of the Icon Subviews menu selections available for the Interface Label.

Table 5: Interface Label Icon Subviews Menu

Option	Opens the ...
IF Details	Interface breakdown detail view displays three pie charts of packet, error, and discard information See ***SPECTRUM Views*** for more details.
IF Status	*Interface Status View* allows you to set the operational status (turn the port on or off) through the Administrative Status button.
IF Configuration	*Interface Configuration View* (Page 34) provides interface specific configuration information.
Secondary Address Panel	*Secondary Address Panel* displays the current IP address for this interface.
IF Thresholds	Interface Threshold view, which lets you set the on/off alarm thresholds for load, packet rate, error rate, and % discarded for the interface.
Model Information	*Model Information View* (Page 48) for this interface.

Interface Status View

Access: *From the **Icon Subviews** menu for the Interface icon in the Interface Device view, select **IF Status**.*

The Interface Status view provides the following information on the status of the interface:

Operational Status

Displays the current operational state of the interface is displayed (`Up`, `Down`, `Testing`, or `Unknown`).

Administrative Status

Allows you to select the desired operational state of the interface (`On`, `Off`, or `Testing`).

Secondary Address Panel

Access: *From the **Icon Subviews** menu for the Interface icon in the Interface Device view, select **Secondary Address Panel**.*

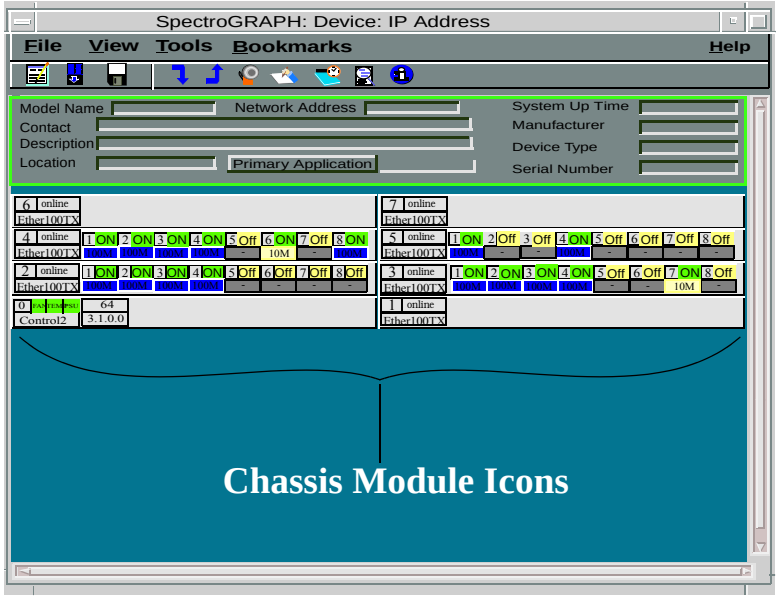
This panel provides a table of IP addresses and masks obtained from the Address Translation Table within the device's firmware. You can change the current address displayed in the **IP Address** field by selecting an entry from the table in this panel and clicking the **Update** button.

Chassis Device View

Access: *From the **Icon Subviews** menu for the Device icon, select **Device > Chassis**.*

This view (Figure 5) shows an example of a Chassis Device View, which displays the modules contained within the chassis, their location, and ports. The ports are represented by dynamic icons that display operational status.

Figure 5: Chassis Device View



Chassis Module Icons

These icons (Figure 6) represent the physical modules as installed in the chassis.

Module Identification Labels

These labels display the following information:

Slot Number Label

The location of the module within the chassis.

Model Type Label

The type of network interface module in the chassis slot.

Interface Labels

These labels display the following information:

Interface Type Label

The number and type for this interface.

Interface Status Label

The current operating status of this interface.

Chassis Module Icon Subviews Menu

The only Icon Subviews menu selection specific to the Chassis Module for each device within the SmartSwitch Router chassis are:

Module Notes - Opens the Module Notes window, which allows you to write and save notes for the selected module within this Chassis view.

Board Detail - Opens the *Router Module Detail View* (Page 17).

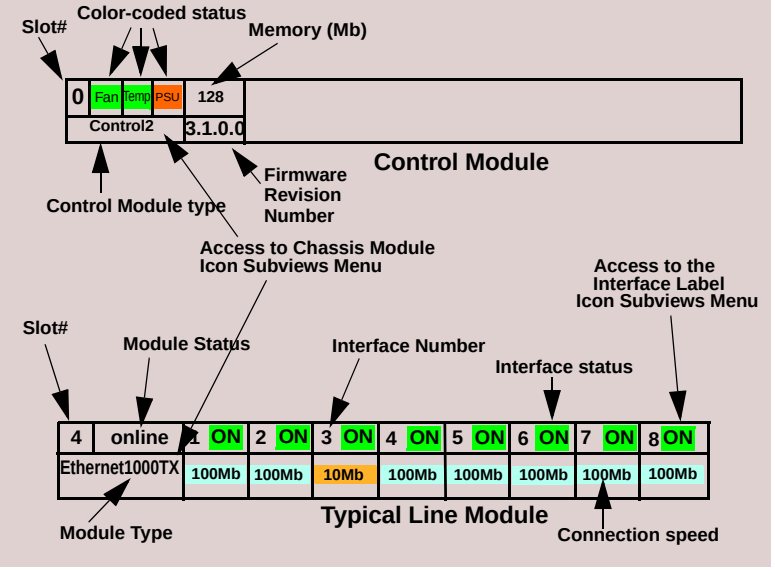
The following options only exist on the Control Module:

Environment - Opens the *Environment View* (Page 26).

Utilization - Opens the *Utilization View* (Page 17).

Reconfigure Model- Allows you reconfigure this particular model.

Figure 6: Chassis Module Icon



Router Module Detail View

Access: *From the **Icon Subviews** menu for the Chassis Module, select **Board Detail**.*

This view displays the following information:

Slot
The physical slot number of the module.

Module Description
The description of the module. For the Control Module, it should have the software version, the amount of dynamic RAM, and flash RAM.

Version
The alphanumeric version string for this module.

Status
The current status of this module. Valid values are: `online`, and `offline`.

Service
The service identifier string for this module.

Memory (Mb)
System Memory size available on the Module. reports `-1` if no memory exists on this module, such as power supplies.

Number of Ports
The number of physical ports on this module.

Utilization View

Access: *From the **Icon Subviews** menu for the Chassis Module, select **Utilization**.*

This view displays the following information:

CPU%
The CPU utilization. An alarm will be generated when 85% is exceeded.

CPUMem%
The internal CPU memory utilization. An alarm will be generated when 85% is exceeded.

Line Module Icon Subviews Menu

Table 6 describes each of the device-specific Icon Subviews menu options available for the Line Module.

Table 6: Line Module Icon Subviews Menu

Option	Opens the ...
Sub-Interfaces	Sub-Interfaces views which displays a the selected inface icon in the chassis.
IF Performance	*IF Performance View* (Page 33).
IF Details	Interface breakdown detail view which displays three pie charts of packet, error, and discard information described in detail in the ***SPECTRUM Views*** documentation.
IF Status	*Interface Status View* (Page 14) allows you to set the operational status (turn the port on or off) through the Administrative Status button.
IF Configuration	*Interface Configuration View* (Page 34) provides interface specific configuration information.
Network Information Panel	Network Information Panel.
IF Thresholds	Interface Threshold View allows you to view and set the thresholds for this interface.
Model Information	*Model Information View* (Page 48) for this interface.

Chassis Device View for the 6-SSRM-02

Access: *From the **Icon Subviews** menu for the 6-SSRM-02, select **Device > Chassis**.*

This view displays the Chassis Information for the 6-SSRM-02 device:

Power Redundancy

Displays the source of power for the chassis. `Redundant` indicates that power from the secondary source is being used for the chassis. `NON_redundant` indicates that power from the primary source is being used.

PS #1 Status

The status for power supply one.

PS #2 Status

The status for power supply two.

Chassis Fans

Displays the operation state for the chassis fans. Table 7 displays the state and color indications for the power supplies and chassis fans:

Table 7: Chassis Information Status

Color	Definition
Green	Normal
Gray	Not Installed
Red	Not operational
Blue	Unknown

Device Topology Views

This section provides brief descriptions of the Device Topology views available for models of SmartSwitch Router devices in SPECTRUM.

Device Topology views show the connections between a modeled device and other network entities. The SmartSwitch Router has two Device Topology views:

- *Chassis Device Topology View*
- *Interface Device Topology View*

Chassis Device Topology View

Access: *From the **Icon Subviews** menu for the Device icon, select **DevTop > Chassis**.*

Figure 7 shows an example of the Chassis Device Topology view. The lower panel of the view uses Interface icons to represent the device's serial/network I/O ports for a selected module. The port labels in this view provide the same information and menu options as those described under the *Interface Icons* (Page 12).

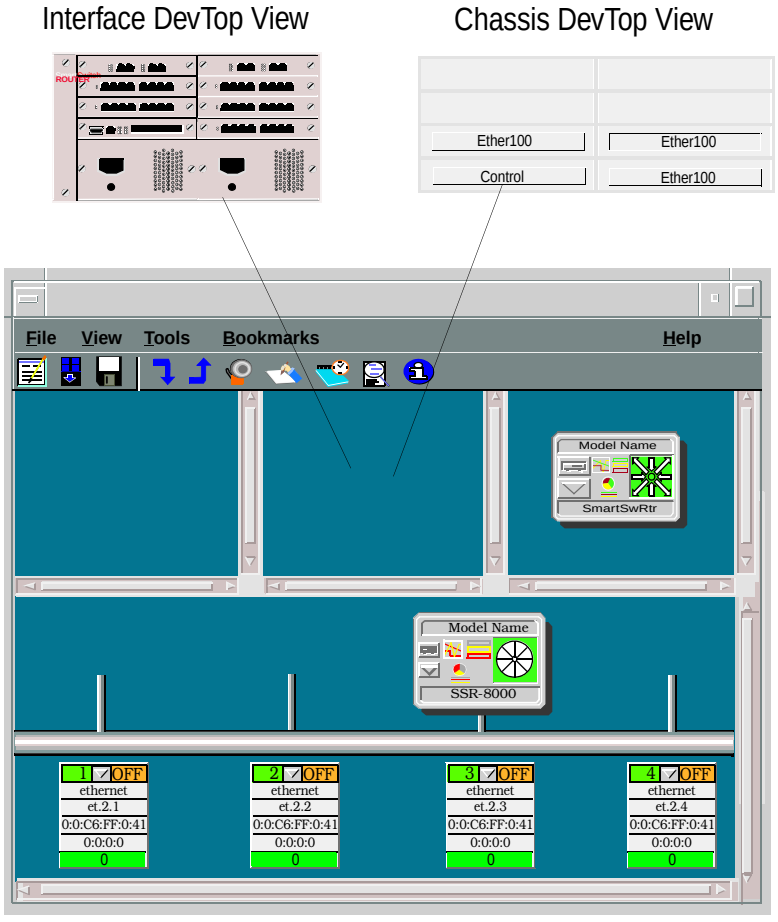
Interface Device Topology View

Access: *From the **Icon Subviews** menu for the Device icon, select **DevTop > Interface**.*

The lower panel of the Interface Device Topology view (Figure 7) uses interface icons to represent the device's serial/network I/O ports. These icons provide the same information and menu options as those in the *Interface Device View* (Page 11). If there is a device connected to a particular interface, a device icon appears on the vertical bar above the interface icon with an icon representing the network group that contains the device.

For further information on Device Topology views, refer to ***SPECTRUM Views***.

Figure 7: Device Topology View



In the Chassis Device Topology view, only interfaces for a selected module will be displayed. For the Interface Device Topology view, all interfaces for each module will be displayed.

Sub-Interfaces Topology View

Access: *From the **Icon Subviews** menu for an Interface icon whose interface contains sub-interfaces, select **Sub-Interfaces**.*

When present, the endpoints associated with multiplexed, physical connections are modeled by SPECTRUM as sub-interfaces. This includes, for example, Permanent Virtual Circuits (PVCs) on a physical ATM interface and DCL circuits on a physical Frame Relay interface.

The lower panel of the Sub-Interfaces Topology view uses Interface icons to represent these non-physical entities and circuits that are connected to the physical interface. These Interface icons provide the same labels and menu options as the Interface icons in the *Interface Device View* (Page 11).

Application Views

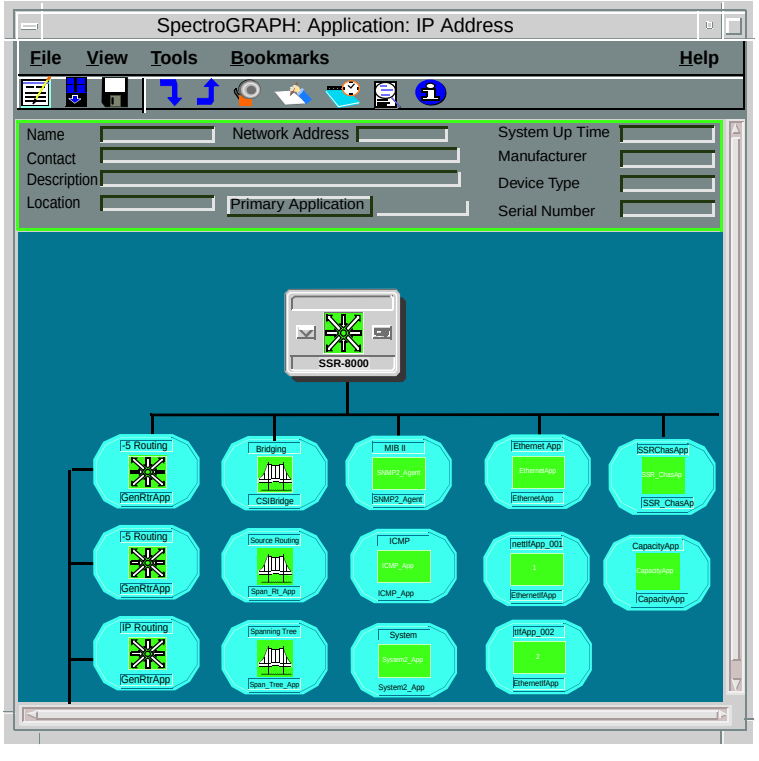
This section describes the main Application view and the associated application-specific subviews available for models of SmartSwitch Router devices in SPECTRUM.

Access: *From the **Icon Subviews** menu for the Device icon, select **Application**.*

Main Application View

When a device model is created, SPECTRUM automatically creates models for each of the major and minor applications supported by the device. The main Application view identifies all of these application models, shows their current condition status, and provides access to application-specific subviews. Figure 8 shows this view in the Icon mode. If you prefer the List mode, which displays applications as text labels, select **View > Mode > List**.

Figure 8: Application View



Supported Applications

SPECTRUM's applications can be grouped within two general categories as follows:

- Applications associated with non proprietary MIBs. See *Supported Applications* below.
- Applications associated with device-specific MIBs. See *Device-Specific Applications* (Page 24).

Common Applications

For the most part, these applications represent the non proprietary MIBs supported by your device. Listed below (beneath the title of the SPECTRUM document that describes them) are some of the common applications currently supported by SPECTRUM.

The documents listed below (in bold font) are available for viewing at:

www.aprisma.com/manuals/

- ***Routing Applications***
  - Generic Routing
  - Repeater
  - AppleTalk
  - DECnet
  - OSPF
  - OSPF2
  - BGP4
  - VRRP
- ***Bridging Applications***
  - Ethernet Special Database
  - Spanning Tree
  - Static
  - Transparent
  - PPP Bridging
  - Source Routing
  - Translation
  - QBridge
- ***MIB II Applications***
  - SNMP
  - IP
  - ICMP
  - TCP
  - System2
  - UDP
- ***Transmission Applications***
  - FDDI
  - Point to Point
  - DS1
  - DS3
  - RS-232

- WAN
- Frame Relay
- Token Ring
- Ethernet
- Fast Ethernet
- rfc1317App
- rfc1285App
- rfc1315App
- 802.11App
- SONET

- ***Technology Applications***
  - APPN
  - ATM Client
  - DHCP
  - PNNI
  - rfc1316App
  - DLSw

Device-Specific Applications

The views and subviews available for SmartSwitch Router device-specific applications are described in the rest of this section, grouped by major application as listed below:

- *SSR Chassis Application (SSR_ChasApp)* (Page 24)
- *Container Application (ContainerApp)* (Page 28)
- *Capacity Application* (Page 31)
- *Policy Application* (Page 31)

SSR Chassis Application (SSR_ChasApp)

This major application (SSR_ChasApp) has a single minor application: *Capacity Application Configuration View* on Page 35 (CapacityApp). It also provides the following application-specific subviews:

- *Module Hardware View* (Page 25)
- *Port Hardware View* (Page 25)
- *Environment View* (Page 26)
- *Service Status View* (Page 27)

Module Hardware View

Access: *From the **Icon Subviews** menu for the SSR_ChasApp Application icon, select **Module Hardware**.*

This view provides information about the modules installed in the chassis, such as slot location, and module type.

Module Hardware

This section of the Module Hardware view identifies the modules installed in the chassis by providing the following information:

Module
Displays the location of the module in the chassis.

Description
Describes the module installed in the location listed underneath **Module**.

Ports
Displays the number of ports for that module.

Version
Displays the hardware version of that module.

Mem
The amount of memory on a module (in Mbytes).

Service
The Aprisma service identifier string for this card/module. Unique to a module in production, used by Aprisma Service and Manufacturing to identify shipped inventory.

Port Hardware View

Access: *From the **Icon Subviews** menu for the SSR_ChasApp Application icon, select **Port Hardware**.*

This view provides information about the ports for all modules installed in the chassis, such as slot number for the module, port number, and port types.

Port Hardware

This section of the Port Hardware view identifies the ports on the line modules installed in the chassis by providing the following information:

Module
Displays the location of the module in the chassis.

Port
Displays the port number for that module.

Port Type
Displays the type of port. For example `etherfast` - for a Fast Ethernet port.

Connector Type
Displays the type of port connector being used.

IF Index
Displays the entry in the MIB-ll Interface Table corresponding to this port.

Environment View

Access: *From the **Icon Subviews** menu for the SSR_ChasApp Application icon, select **Environment**.*

This view provides information about the conditions of the chassis, such as power supply operation, and fan operation.

Chassis ID
Displays the unique identification number for this chassis.

Num Slots
Displays the total number of slots for this chassis.

Last Hot Swap
The time the module was last hot swapped.

Fan
Indicates whether or not the fan is functioning.

Temperature
Indicates whether or not temperature control is functioning.

CM Backup State
Indicates status of the backup Control Module.

> Regardless of which Control Module happens to be Primary, the Administrator can set up an Alarm Watch to be notified of the failure of the backup module. Select the device, then from the device menu select **Utilities > Watch Manager**. Highlight BackupCMwatch and make the watch Active. The selected watch will now enter the Initial watch status.

Switch Fabric
If a redundant switch fabric is employed, this icon indicates which is primary and which is backup. The Administrator can set up an Alarm Watch on the switch fabrics to activate if either device fails. To do this:

1. Select device, then from device menu select **Utilities> Watch Manager**.

Note that the selected model is highlighted on the left, and three watches are shown on the right.

FabricStatewatch is shown as **inactive**.

2. Highlight FabricStatewatch and select **Activate**.

The selected watch will now enter the **Initial** watch status.

Any change in the watched attributes, which are polled at the device model polling interval, will now trigger the appropriate watch, with corresponding event and alarm information. The alarm will be cleared should the watched attribute return to its expected value. Note that the SpectroSERVER would need to be restarted to recognize existing bad values.

Alternatively the watch editor can be used to change the watch properties from ByIMT to By Polling, setting the watch poll period to an appropriate interval and activating the watch. Now an alarm will be generated at each watch poll period if the value is not as expected.

Control Module
Status of the shelf/chassis Active Control Module's four LED displays.

PSU Status
Displays the status of each of the power supplies. An Alarm Watch is applied to the power supplies by default and the Administrator is notified at the failure of either Primary or Secondary PSU.

Service Status View

Access: *From the **Icon Subviews** menu for the SSR_ChasApp Application icon, select **Service Status**.*

This view provides status of the routing protocols such as; RIP, OSPF, and BGP, and multicast protocols such as; IGMP, DVMRP, and PIM.

RIP
Displays the current status of RIP in the switch.

OSPF
Displays the current status of OSPF in the switch.

BGP
Displays the current status of BGP in the switch.

DVMRP
Displays the current status of DVMRP in the switch.

IPX SAP
Displays the current status of IPX SAP in the switch.

IPX RIP
Displays the current status of IPX RIP in the switch.

LFAP
Displays the current status of the LFAP in the switch.

STP
Displays the current status of STP in the switch.

PIM
Displays the current status of PIM in the switch.

IGMP
Displays the current status of IGMP in the switch.

Container Application (ContainerApp)

This major application (Container_App) provides the following application-specific subviews:

- *Container Resource Information* (Page 28)
- *Container Type Report* (Page 29)
- *Container Logical Information* (Page 29)
- *Container Physical Information* (Page 30)
- *Container Network Address Information* (Page 31)

Container Resource Information

Access: *From the **Icon Subviews** menu for the ContainerApp Application icon, select **Container Resource**.*

This view provides the following information:

ID
A unique index that defines a specific physical resource for which this relationship exists.

Type
The type of physical resource for which this relationship is defined.

MIB Pointer
The value of this field defines the start of a MIB that can be used to determine more specific information about the given resource. This may include information about what physical modules the resource is connected to. It may also provide specific control information about the physical resource.

Container Type Report

Access: *From the **Icon Subviews** menu for the ContainerApp Application icon, select **Container Type**.*

This view provides the following information:

Device Type
Identifies the type of device or container. This could be a chassis, module, standalone box etc. A vendor's authoritative identification of this device or container. By convention, this value is allocated within the SMI enterprise subtree (1.3.6.1.4.1), and provides an easy and unambiguous means for determining 'what kind of box' is being managed. If this information is not present or unknown, its value should be set to the `contUnknownTypeID`.

No. of Slots
Number of slots in the device. For bounded, slot-less systems, the value of this field shall be `zero`.

No. of Physical Changes
Depicts the number of physical changes that have occurred to this MIB. This includes additions and removal of components in the component table.

No. of Logical Changes
Depicts the number of logical changes that have occurred to this MIB. This includes all sets to name strings, etc.

Serial Number
Reflects the revision level of the device. If no serial number is available for the device then this field will be the zero length string.

No. of Container slots
Number of slots in the container in which the device is installed. For bounded, slot-less systems, the value of this field will be `zero`.

Container slot no. for the device
The slot number in a container in which the device is installed. If the slot number is unknown then this value will be `zero`.

Container Logical Information

Access: *From the **Icon Subviews** menu for the ContainerApp Application icon, select **Container Logical**.*

Double-clicking on an entry in this table displays the Container Logical Information View. This view displays the same information as Container Logical Information except it allows you to change some of the fields.

This view provides the following information:

ID
A unique value identifying a component, which includes, but is not limited to, routers, bridges, and terminal servers. Multiple instances of a

functional device may exist within the same container.

Type
Identifies the component type within this container. If this information is not present or unknown, its value should be set to the OBJECT IDENTIFIER {0 0}.

Name
A textual description of the component.

Version
A textual description of the version/revision level for this component's software.

ROCommStr
The read-only community string to access MIBs registered to this component.

RWCommStr
The read-write community string to access MIBs registered to this component.

SUCommStr
The super-user community string to access MIBs registered to this component.

AdminStatus
The administrative status. Valid values are: `enable`, `disable`, and `reset`.

OperStatus
The operating status. Valid values are: `unknown`, `invalid`, `enabled`, `testing`, `operational`, `error`, `disabled`, and `delete`.

Container Physical Information

Access: *From the **Icon Subviews** menu for the ContainerApp Application icon, select **Container Physical**.*

This view provides the following information:

ID
The slot number containing this module.

Entries
The number of slots that this module occupies. Some modules require more than one physical front panel slot while only using a single backpanel slot. In this case this field will reflect the number of slots occupied by the physical module. This field will have a value of 1 for all single slot modules.

Entry Class
The class (or type) of slot.

Entry Type
Uniquely defines the module type. A vendor's authoritative identification for a module. By convention, this value is allocated within the SMI enterprises subtree (1.3.6.1.4.1), and provides an

easy and unambiguous means for determining the type of module.

TimeStamp
The value of sysUpTime for this management entity, when this module was last (re-)initialized.

EntryStatus
The module status. Valid values are: `reset`, `poweroff`, `busy`, `crippled`, `operational`, `error`, `testing` and `booting`.

Container Network Address Information

Access: *From the **Icon Subviews** menu for the ContainerApp Application icon, select **Network Address View**.*

This view provides the following information:

Index
A unique value identifying a network address.

NetworkType
Identifies the Network type e.g., Inband, etc.

NetAddress
The network address of the device for a particular network.

Capacity Application

Refer to *Capacity Application Configuration View*.

Policy Application

Refer to *Policy Configuration View*.

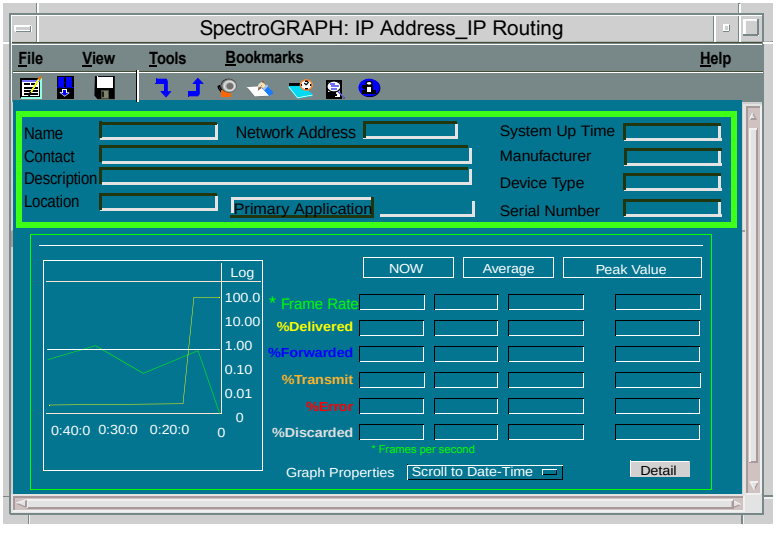
Performance Views

This section provides brief descriptions of the Performance views available for models of SmartSwitch Router devices in SPECTRUM.

Performance views (Figure 9) are available for the device, its ports, the modules it manages, and their ports. The performance views listed below provide statistical information such as load, frame rate, errors, collisions, etc. For the definitions for these statistics and a description of performance views, refer to ***SPECTRUM Views***.

- *Device Performance View* (Page 33)
- *IF Performance View* (Page 33)

Figure 9: Device Performance View



Device Performance View

Access: *From the* ***Icon Subviews*** *menu for the Device Icon, select* ***Performance****.*

This view provides performance information about the packets being passed through the device. The following packet statistics for the entire device are displayed in this view:

- Frame Rate
- % Delivered
- % Forwarded
- % Transmit
- % Error
- % Discarded

IF Performance View

Access: *From the* ***Icon Subviews*** *menu for the Interface icon in the Device Topology view, select* ***IF Performance****.*

This view provides performance information about the packets being passed through the Interfaces on the modules managed by the SmartSwitch Router. The following packet statistics for the interface selected are displayed in this view:

- Load
- Packet Rate
- % Error
- % Discarded

Configuration Views

This section describes the various Configuration views and subviews available for models of SmartSwitch Router devices in SPECTRUM.

Configuration views let you view and modify current settings for the modeled device and its interfaces, ports, and applications. The following Configuration views are available for models of SSR8000 and SSR8600 devices:

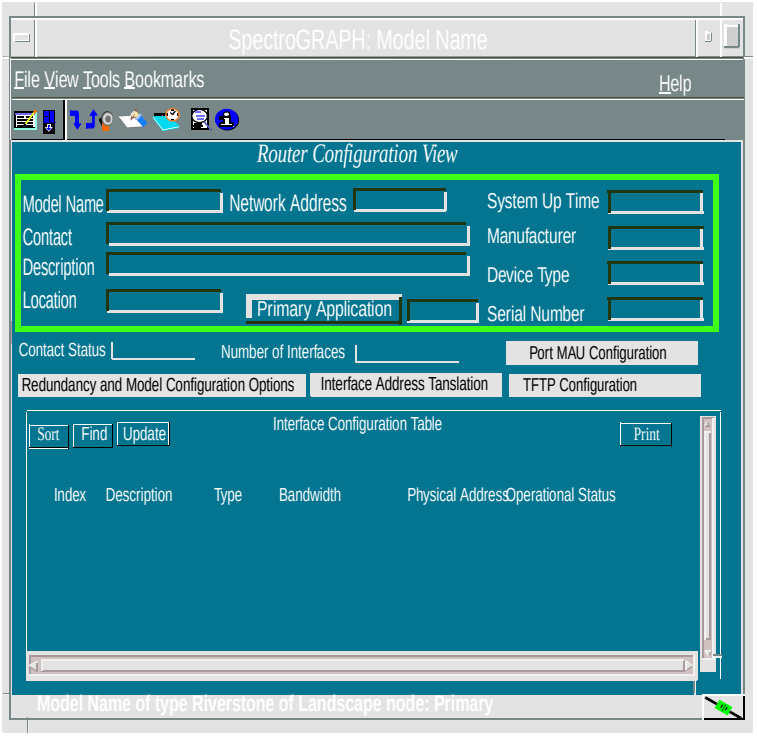
- *Interface Configuration View*
- *Capacity Application Configuration View* (Page 35)
- *SmartSwitch Router Configuration View* (Page 38)
- *Policy Configuration View* (Page 42)

Interface Configuration View

Access: *From the* ***Icon Subviews*** *menu for a selected Interface icon in the Interface Device view, select* ***Interface Configuration****.*

Figure 10 displays the Interface Configuration view. Column headings are provided below for the selected interface:

Figure 10: Interface Configuration View



Operation Status
The current operational state of the interface. Valid values are: `Up`, `Down`, or `Testing`.

Admin. Status

The desired operational state of the interface. Valid values are: `Up`, `Down`, `On`, or `Testing`.

Last Change
The sysUpTime value when the interface entered its current operational state.

PhysAddress
The Ethernet (MAC) address of the interface.

Bandwidth
The estimated bandwidth of the interface, measured in bits per second. For interfaces that do not vary in bandwidth, or when no accurate estimate can be made, a nominal bandwidth is provided.

Packet Size
The largest packet that can be transmitted or received by the port, displayed in octets.

Queue Length
The length of the outbound packet queue, in packets.

Capacity Application Configuration View

Access: *From the **Icon Subviews** menu for the CapacityApp Application icon, select **Configuration**.*

This view displays the following information:

Slot Count
The maximum number of slots in the chassis, including the slot for the CPU module.

Slots Used
The number of slots used in the chassis. This number includes the slot used for the CPU module, if any.

Slots Free
The number of free slots in the chassis. This includes all of the available slots not used by the CPU or redundant CPU card.

CPU Redundancy
The chassis CPU redundancy capability of the SSR. Valid values are: `noSupport`, `available`, `enabled`, and `disabled`.

PS Redundancy
The chassis Power Supply redundancy capability of the SSR. Valid values are: `noSupport`, `available`, `enabled`, and `disabled`.

SF Redundancy
The chassis Switching Fabric redundancy capability of the SSR. Valid values are: `noSupport`, `available`, `enabled`, and `disabled`.

Memory Table

Opens the *Capacity - Memory Table View* (Page 36).

CPU Table

Opens the *Capacity - CPU Table View* (Page 37).

Task Table
A summary of the tasks running on a CPU enabled module in the chassis. Column headings are as follows:

Task
A unique index assigned to a task instance. This index is unique to the task for the time SSR is booted. If the task is terminated, the index will not be reused for another task that might become active in the system.

Name
The encrypted name assigned to this task. This is unique for each different type of task, but there may be multiple instances of the same task running in the system.

Sched
The number of times this task has been scheduled to run. This is a cumulative count from the time the SSR was started.

Status
The current status of this task.

MemUsed
The size of the memory consumed by this task. This can be used to monitor any excess memory used by a particular task and is expressed in bytes.

Capacity - Memory Table View

Access: *From the **Capacity Application Configuration View**, click on the **Memory Table** button.*

A summary of the non-volatile storage devices in the SSR. Column headings are as follows:

Index
An index or enumeration for the entries of a particular memory type. This corresponds to:

- Interface index for L2Hardware Type
- Module index for L3Hardware Type
- Enumeration for everything else.

Description
The description of the memory device.

Size
Memory device total memory capacity expressed in blocks.

Free
Device free memory in blocks. This will include any unused memory between used memory blocks and is calculated by subtracting the memory used from the size of the memory device.

Used
Size of used memory on the memory device. This includes the blocks of memory that are only partially used and is expressed in blocks.

BlockSize
Size of the memory blocks on the memory device. This is the minimum block size of memory returned when memory is requested and is expressed in bytes.

Failures
The number of times a memory allocation in this memory device has failed. In the case of L2Hardware and L3Hardware types it expresses the number of times a Full Hash Bucket condition has been met.

Removable
Indicates if the memory type is removable. Valid values are: yes and no.

Capacity - CPU Table View

Access: *From the **Capacity Application Configuration View**, click on the **CPU Table** button.*

Summary of CPU statistics. It is assumed that there is only one CPU per line card.Index. This view displays the following information:

Index
The slot index in which the current CPU is residing.

CurrUtil
The CPU utilization expressed as an integer percentage. This is calculated over the last 5 seconds at a 0.1 second interval as an average.

L3Learned
The total number of new layer 3 (L3) flows the CPU has processed and programmed into the L3 hardware flow tables. L3 flows are packets for IP or IPX protocols that will be routed from one subnet to another. Bridged flows or IP and IPX flows that originate and terminate in the same subnet are accounted for by **L2Learned**.

L3Aged
The total number of L3 flows that have been removed from the L3 hardware flow tables across all modules by the L3 aging task. This number may increase quickly if routing protocols are not

stable. Removal or insertion of routes into the forwarding table will cause premature aging of flows. Flows are normally aged/removed from the hardware when there are no more packets being sent for a defined time period. This counter is cumulative from the time the system started.

L2Learned
The number of Layer 2 (L2) flows or addresses learned. The intended result here is to see how many stations attempt to establish switched communication through the SSR.

L2Aged
The total number of L2 addresses or flows aged out. Hosts that end switched communication through the SSR are aged out every 15 seconds.

NIA-rcvd
The total number of packets received by the NIA chip. This is useful in gauging how many packets are forwarded to the CPU for processing.

NIA-txd
The total number of packets transmitted by the NIA chip. This is useful in seeing how much the CPU is communicating directory with management stations and other routers.

SmartSwitch Router Configuration View

Access: *From the **Icon Subviews** menu for the Device icon, select **Configuration**.*

Contact Status
The contact status of the model.

Number of Interfaces
The number of interfaces on the model.

Redundancy and Model Reconfiguration Options

Opens the *Redundancy and Model Reconfiguration Options View* (Page 39).

IP IF Address Translation

Opens the *Interface Address Translation Table* (Page 41).

TFTP Configuration

Opens the *SmartSwitch Router TFTP View* (Page 41).

Interface Configuration Table

Double-clicking on an entry in this view opens the Interface Configuration View. This view provides the same information as the *Interface*

Configuration View (Page 34). Fields in this view can be updated.

This section provides the following information:

Index
The interface index.

Description
Contains the name of the device and the hardware revision number.

Type
The type of module plugged into the slot. Module types `OC8600` and `OC860x(860x)` represent the mother board with the CPU and system memory. Module state `none` represents a slot with no modules plugged in.

Bandwidth
The estimated bandwidth of the interface, measured in bits per second. For interfaces that do not vary in bandwidth, or no accurate estimate can be made, a nominal bandwidth is provided.

Physical Address
The Ethernet (MAC) address of the interface.

Operation Status
The current operational state of the interface. Valid values are: `Up`, `Down`, or `Testing`.

Admin Status
The desired operational state of the interface. Valid values are: `Up`, `Down`, or `Testing`.

Last Change
The sysUpTime value when the interface entered its current operational state.

Queue Length
The length of the outbound packet queue, in packets.

Packet Size
The largest packet that can be transmitted or received by the port, displayed in octets.

Redundancy and Model Reconfiguration Options View

Access: *From the **Icon Subviews** menu for the Application icon, select **Rtr Redundancy**.*

This view allows you to enable redundant addresses, have SPECTRUM notify you of a redundancy update, and reconfigure aspects of your network connections. This view displays the following information:

Redundancy Administrative Status

Setting this button to **Enabled** will cause SPECTRUM to display a redundant address from the Redundant Preferred Address list when the primary address is not accessible.

Automatically Reconfigure Interfaces

Setting this button to **True** will cause SPECTRUM to monitor the number of interfaces for this device. If a change is detected by SPECTRUM, the interfaces displayed in SPECTRUM will be updated to reflect the change.

Reconfigure due to LINK UP/Down events

Setting this button to **True** will cause SPECTRUM to verify the interfaces displayed when a LINK UP or LINK DOWN event is received.

Device Discovery after Reconfiguration

Setting this button to **True** will cause SPECTRUM to verify the interfaces displayed after a model reconfiguration occurs.

Generate Redundancy Alarms

Setting this button to **True** will cause SPECTRUM to generate an alarm when a redundant address has been selected.

Create Sub Interfaces

Setting this button to **True** will cause SPECTRUM to display sub-interfaces in the DevTop view when RFC1573 is supported by the device.

Topologically Relocate the Model

Setting this button to **True** will cause SPECTRUM to relocate the model for this device to a different topological location as part of AutoDiscovery.

Button Explanations

Clicking this button will display a window that allows you to read definitions for the buttons included in the Redundancy and Model Reconfiguration Options view.

Reconfigure Model

Clicking this button will cause SPECTRUM to verify and change the interfaces displayed for this device when necessary. If the **Topologically Relocate the Model** button is set to **`True`**, this button will also execute a device discovery.

Discover LANs

Clicking this button will cause SPECTRUM to execute a device discovery on this devices connections.

Interface Address Translation Table

Access: *From the **SmartSwitch Router Configuration** view, click on the **IP IF Address Translation** button.*

This table provides the physical and network addresses associated with the interface index.

Interface Index
A pointer to the entry in the Interface Table corresponding to this port.

Physical Address
The Ethernet (MAC) address of the interface.

Network Address
The IP Address of the interface.

SmartSwitch Router TFTP View

Access: *From the **SmartSwitch Router Configuration View**, click on the **TFTP Configuration** button.*

This view allows you to manage SmartSwitch Router configuration files and perform file transfers to and from the manager and agent. Column headings are as follows:

Manager Address
Displays the address for the manager used by the agent for CFG transfer operations. The value `0.0.0.0` is the default. The address must be a unicast address that is reachable from the agent.

File Name
Displays the file name to be retrieved from the tftp server at the host manager address or the file name to be written to. The default is blank.

Transfer Operation

Transfer Operation
Displays the transfer operation to be performed. Send and receive operations use tftp to transfer files from the manager to the agent. Table 8 lists possible operations:

Table 8: Transfer Operations

Operation	Description
noop	No operation.
sendConfigToAgent	Send configuration to agent.
receiveConfigFromAgent	Receive configuration from agent.
receiveBootlogFromAgent	Receive boot log from the agent.

Activate Transfer

Allows you to activate the file transfer operation. Enter **`True`** to activate the file transfer. Enter **`False`** to stop it. The **Transfer Status** field will displays the current status. `False` is the default.

Transfer Status
Displays the current transfer status. Conditions are: `idle`, `sending`, `receiving`, `transfer`, and `complete`.

Last Error
Displays the reason code for the last transfer operation.

Last Error Reason
Displays details for the last error code displayed under the **Last Error** field.

Activate File

Enter **`True`** to activate a new configuration once a file transfer to the SmartSwitch router has been completed.

Policy Configuration View

Access: *From the **Icon Subviews** menu for the SSR_PolicyApp, select **Configuration**.*

This view displays the following information:

ACLs defined by a Policy Server

button: true/false

Remote Policy Configuration
Remote Policy Configuration is allowed when set to `true`. Only local (to SSR) policies may be applied.

Number of L2 filters defined
The number of L2 filters that are defined.

Time L2 filter last changed
The time the L2 Filter was last changed.

L2 Filter Table

Opens the *Policy - L2 Filter Table View* (Page 43).

Layer 3 ACLs in service
The number of Layer 3 Access Control Lists (ACLs) in service in the SSR.

L3 Interfaces in service
The number of Layer 3 Interfaces in service in the SSR.

ACLs in service in last change
The time the last ACLs in service were updated.

IF Policy in service last change
The time the Interfaces in service were last changed with regard to policy.

Interface Policies and Services

Opens the *Interface Policies and Services View* (Page 45).

L4 Policies

Opens the *L4 Policy Configuration* (Page 46).

Number of ACLs
The number of Layer 3 ACLs defined in the SSR.

ACL last changed
The time the ACL were last changed.

ACL Table

This table displays the following information:

Name
The administratively assigned name to this static route entry.

Restricted
The permissions/restrictions given to this static route entry. Valid values are: `permit` and `deny`.

Protocol
The IETF protocol to which this ACL applies.

Status
The status of the ACL.

Policy - L2 Filter Table View

Access: *From the Policy Configuration View, select the **L2 Filter Table** button.*

This view displays the following information:

Last Changed
The time the ACLs were last changed.

Number defined
The number of Layer 2 ACLs defined in the SSR.

L2 Filter Table

This table displays the following information:

Name
The administratively assigned name to this L2 Filter entry.

Type
The types of filters, as explained below.

`static-entry` - Based on the restrictions and the presence of source and destination MAC addresses, they can be of three types, as listed in Table 9:

Table 9: Type = static-entry

Type	Description
source-static-entry	All frames with a source address equal to “srcMAC,” coming through any of the inPorts will be allowed/disallowed to go to any port that is a member of the outPorts list.
destination-static-entry	All frames with a destination address equal to “dstMAC,” coming through any of the inPorts will be allowed/ disallowed/forced to go to any port that is a member of the outPorts list.
flow-static-entry	All frames with a source address equal to “srcMAC” and a destination address equal to “dstMAC,” coming through any of the inPorts list will be allowed/ disallowed to go to any port that is a member of the outPorts list. Ports must be in flow-bridging mode in order to use filters with both src and dst mac specified.

`address-filter` - Based on the restrictions and the presence of source and destination MAC addresses, they can be of three types as listed in Table 10:

Table 10: Type = address-filter

Type	Description
source-address-filter	All frames with a source address equal to “srcMAC,” coming through any of the inPorts will be filtered out.
destination-address-filter	All frames with a destination address equal to “dstMAC,” coming through any of the inPorts will be filtered out.
flow-filter	All frames with a source address equal to “srcMAC” and a destination address equal to “dstMAC,” coming through any of the inPorts list will be filtered out. Ports must be in flow mode in order to set a filter using both source and destination address.

`port-address-lock` - This locks a source address to a port. It allows learning of srcMAC addresses only on any of the ports in inPorts. The following fields are mandatory and must be set by mgmt station to activate a row: **polL2FilterDesc**, **polL2FilterSrcMacAddr**, **polL2FilterInPorts** secure-port.

This blocks all traffic in a given direction to a port. Used with static entries, it is effective in allowing only certain well defined source/ destination Mac addresses.

The following fields must be set by mgmt station to activate an entry: **polL2FilterDesc**, **polL2FilterInPorts**. This field may not be modified if the associated **Status** field is equal to "active."

Restrictions

The first 3 restrictions, `allow`, `disallow`, and `force` apply when the **Type** is "static-entry." When **Type** is "addressFilter" or "portAddressLock," this field does not apply. For "securePort," the `blockIngress`, and `blockEgress` values apply. This field may not be modified if the associated **Status** field is equal to "active."

Interface Policies and Services View

Access: *From the Policy Configuration View, select the* ***Interface Policies and Services*** *button.*

A list of IP Interfaces in service and their policy status. Each IP Interface can be defined to use local static policy or remote dynamic policy in the configuration.

Interface Policies

This table displays the following information:

Interface

The ifIndex of the IP Interface to which the ACL is applied.

Direction

The direction the ACL is applied to the particular port. Valid values are: `ingress`, `egress`, and `both`.

Status

Rules for what type of management can apply ACLs to a particular interface. If set to `remote`, then a Policy Manager via SNMP may change dynamically the ACLs applied to an interface. Note, ACLs applied dynamically are not maintained across system reboot. Use `local` to

setup the basic rules then apply dynamic rules as necessary. Valid values are: `local` and `remote`.

Service Table

This table displays the following information:

Name
The administratively assigned name to this entry.

Direction
The direction the ACL is applied to the particular port. Valid values are: `ingress`, `egress`, and `both`,

Interface
The ifIndex of the IP Interface to which the service is applied.

Status
SNMP V2 RowStatus control for this table.

L4 Policy Configuration

Access: *From the Policy Configuration View, select the **L4 Policies** button.*

This view displays the following information.

Policy Based Routing Enabled
The state of Policy Based Routing on this network element.

Number of Next Hop Routers
The number of next hop routers currently available.

Next Hop Table Last Change
The value of sysUpTime when a row was last added or deleted from polL4NextHopTable.

Flow Control Table Last Change
The value of sysUpTime when a row was last added or deleted from polL4lowControlTable.

Number of Policies
The number of policies currently available.

Flow Match Attempts
The count of total number of policy based flow lookups made against policy based route table.

Next Hop Table

This table displays the following information:

Router
The IP Address of the next hop router flow will be sent to.

State
The current status of the **Router**. If no entry found when a policy route is activated, then arp for the request the state will be `waitingForArp`. If a reply is found the state will go to `macAquired` else `noArpReply`. If NextHop is not local, mac is actual nexthop router.

ExitPort
IfIndex of port we learned this router on or else zero if not known.

Next Hop MAC Addr
MAC Address of next hop router learned from ARP.

Flow Control Table

This table displays the following information:

Type
Controls if packets are forwarded or not for this policy.

Action
Defines when this policy should be used during normal packet forwarding process. The default value is `policyBeforeRouteLookup`.

Up to twenty separate ACLs may be defined to match for this policy.

Match
This field is mandatory. Use active row from polAclTable.

Additional

This button is enabled when **polL4lowControlTableActivates** is supported by the device. The view shows the values of attributes **polL4FlowControlTableActivates**, **polL4FlowControlTableActivateFails**, **polL4lowArpMappingChanges**, and **polL4lowLostRouters**.

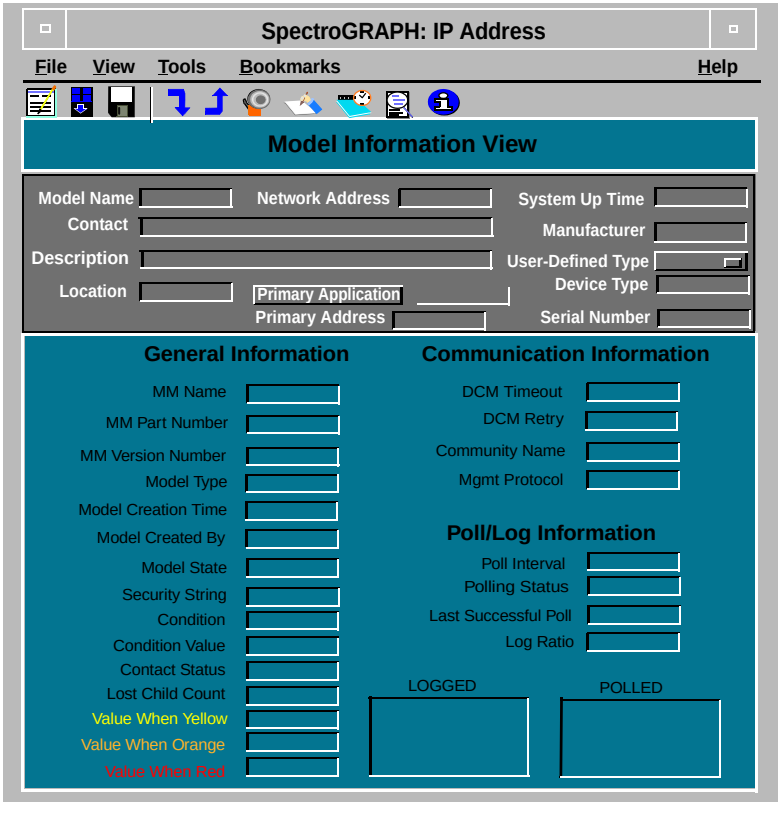
Model Information View

This section provides a brief overview of the Model Information view.

This view displays administrative information about the device and its applications and lets you set thresholds and alarm severity for the device.

Figure 11 shows a sample Model Information view. The layout of this view is the same for all model types in SPECTRUM but some information will vary depending on the model it defines. Refer to the ***SPECTRUM Views*** documentation for a complete description of this view.

Figure 11: Model Information View



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